

Key to Review

p209 1, 3, 6, 7, 11, 15, 18, 20, 21, 28, 30, 33, 37
38, 40, 42, 44, 48

1. identity
3. scalar mult.
6. matrix equation
7. dimension

$$30. \begin{vmatrix} 2 & -3 & 1 \\ 0 & 7 & 8 \\ 2 & 1 & 3 \end{vmatrix}$$

$$2 \begin{vmatrix} 7 & 8 \\ 1 & 3 \end{vmatrix} - 0 \begin{vmatrix} 2 & 1 \\ 2 & 1 \end{vmatrix} + 2 \begin{vmatrix} 2 & 1 \\ 7 & 8 \end{vmatrix}$$

$21 - 8$ $-24 - 7$
 13 -31
 26 $-62 = \boxed{-36}$

$$11. \begin{aligned} 2y - x &= 3 & 2y - (4y - 1) &= 3 \\ x &= 4y - 1 & -2y + 1 &= 3 \\ x &= 4(-1) - 1 & -2y &= 2 \\ x &= -5 & y &= -1 \\ & & & (-5, -1) \end{aligned}$$

$$33. D = \begin{vmatrix} 9 & -1 \\ 3 & 2 \end{vmatrix} = 21$$

$$D_a = \begin{vmatrix} 1 & -1 \\ 12 & 2 \end{vmatrix} = 14$$

$$D_b = \begin{vmatrix} 9 & 1 \\ 3 & 12 \end{vmatrix} = 105$$

$$a = \frac{14}{21} \quad b = \frac{105}{21}$$

$\left(\frac{2}{3}, 5\right)$

$$15. \begin{bmatrix} -4 & 3 \\ -5 & 2 \end{bmatrix} + \begin{bmatrix} 1 & -3 \\ 3 & -8 \end{bmatrix} = \begin{bmatrix} -3 & 0 \\ -2 & -6 \end{bmatrix}$$

$$18. \begin{bmatrix} 1 & 0 & -3 \\ 4 & -5 & 2 \end{bmatrix} - 2 \begin{bmatrix} -2 & 3 & 5 \\ -3 & -1 & 2 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 0 & -3 \\ 4 & -5 & 2 \end{bmatrix} - \begin{bmatrix} -4 & 6 & 10 \\ -6 & -2 & 4 \end{bmatrix}$$

$$\boxed{\begin{bmatrix} 5 & -6 & -13 \\ 10 & -3 & -2 \end{bmatrix}}$$

$$20. = \begin{bmatrix} 13 & -9 \\ 13 & -23 \end{bmatrix}$$

21. Not possible

$$28. \begin{vmatrix} 6 & -7 \\ 5 & 3 \end{vmatrix} = 18 - -35$$

$\boxed{53}$

$$37. D = \begin{vmatrix} 6 & 0 & -7 \\ 0 & 8 & 2 \\ 7 & 0 & 1 \end{vmatrix} = 440$$

$$D_x = \begin{vmatrix} 13 & 0 & -7 \\ 14 & 8 & 2 \\ 6 & 0 & 1 \end{vmatrix} = 440$$

$$D_y = \begin{vmatrix} 6 & 13 & -7 \\ 0 & 14 & 2 \\ 7 & 6 & 1 \end{vmatrix} = 880$$

$$D_z = \begin{vmatrix} 6 & 0 & 13 \\ 0 & 8 & 14 \\ 7 & 0 & 6 \end{vmatrix} = -440$$

$$x = \frac{440}{440} \quad y = \frac{880}{440} \quad z = \frac{-440}{440}$$

$(1, 2, -1)$

$$38. D = \begin{vmatrix} 2 & -1 & -3 \\ 4 & 2 & 1 \\ 2 & 1 & -1 \end{vmatrix} \quad D_x = \begin{vmatrix} -20 & -1 & -3 \\ 6 & 2 & 1 \\ -6 & 1 & -2 \end{vmatrix}$$

$$= -12 \quad = 6$$

$$D_y = \begin{vmatrix} 2 & -20 & -3 \\ 4 & 6 & 1 \\ 2 & -6 & -1 \end{vmatrix} = -12 \quad D_z = \begin{vmatrix} 2 & -1 & -20 \\ 4 & 2 & 6 \\ 2 & 1 & -6 \end{vmatrix} = -72$$

$$x = \frac{6}{-12} \quad y = \frac{-12}{-12} \quad z = \frac{-72}{-12}$$

$$\boxed{\left(-\frac{1}{2}, 1, 6\right)}$$

$$40. \begin{bmatrix} 8 & 6 \\ 9 & 7 \end{bmatrix}^{-1} = \frac{1}{56 - 54} \begin{bmatrix} 7 & -6 \\ -9 & 8 \end{bmatrix} = \boxed{\begin{bmatrix} 7 & -3 \\ -9 & 4 \end{bmatrix}}$$

$$42. \begin{bmatrix} 6 & -2 \\ 3 & -1 \end{bmatrix}^{-1} = \frac{1}{-6 - (-6)} = \frac{1}{0} \quad \text{DNE}$$

$$47. \begin{bmatrix} 3 & 1 \\ 4 & -2 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -8 \\ -14 \end{bmatrix}$$

$$\boxed{(-3, 1)}$$

$$48. \begin{bmatrix} 3 & -5 \\ 4 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -13 \\ 2 \end{bmatrix}$$

$$\boxed{(-1, 2)}$$